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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/821,266

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Tae-Il Yoon

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EXAMINER

GUHARAY, KARABI

ART UNIT

PAPER NUMBER

2879

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/14/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/821,266

Applicant(s)

YOON ET AL.

Examiner

Karabi Guharay

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Amendment, filed on 29 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5,7-11,13-18 and 20-41 is/are pending in the application.
- 4a) Of the above claim(s) 21-35,37 and 39-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-11,13-18,20,36 and 38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Response to Amendment***

Amendment, filed on 29 January 2007 has been considered and entered.

Claims 1 & 8 are amended. Claims 6, 12 and 19 are canceled.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-11, 13-18, 20, 36 & 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umera et al. (US 6239547)

Regarding claims 1-3, 5, 8-10, 14-16, 18 & 36, Umera et al. disclose an electron emission source (see Fig 3) comprising plurality of carbon-based composite particle (406 of Fig 4 and 710 of fig 7C & 7E) and the carbon-based composite comprising a particle (703) comprising silver and a carbon-based material (704) which are carbon nanotubes (lines 18-32 of column 12), which is partially embedded and partially protrudes from the surface of the particle (Figs 7C-7E, lines 49-58 of column 12).

Umera et al. further disclose that the carbon- based materials have diameters of about 4-50nm and the diameter of silver particle is about 1 micron (see lines 66 of column 11 and line 27 of column 12), these composite particles provide the electron source (see Fig 7C). It is well known that surface roughness is directly related to the particle diameter.

Thus though Umera does not explicitly disclose the surface roughness of the electron source, it is intrinsic that the surface roughness is at least 10 angstrom (1nm) since the particle diameter of the carbon material is 4-50 nm.

Regarding claims 4, 11 & 17, Umera et al. disclose that the carbon-based material occupies at least 30% of the entire surface area of the composite particle (see Fig 7A-Fig 7F).

Regarding claims 7, 13 & 20, Umera discloses that the composite particle, silver particle with carbon material protruding from the silver particle forms the electron emission source, further discloses that the carbon-based materials have diameters of about 4-50nm and the diameter of silver particle is about 1 micron (see lines 66 of column 11 and line 27 of column 12). since surface roughness is directly related to the particle size, it is obvious that the surface roughness of the electron source in Umera's device is within 10 angstrom to 10 micron.

Regarding claim 38, examiner notes that the claim limitation of electron emission source is prepared by print coating the composition" is drawn to a process of manufacturing, which is incidental to the claimed apparatus.

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product. It is well established that a claimed apparatus cannot be distinguished over the prior art structure by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject process limitation is not afforded patentable weight (see MPEP 2113).

However, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have surface roughness in the range of 10 armstrong to 10 micron, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. ***MPEP 2144.05 II A***

### ***Response to Arguments***

Applicant's arguments, filed on 29 January 2006 has been considered but are not deemed to be persuasive.

Applicant contends that Umera does not disclose that the surface roughness of the electron source is at least 10 Armstrong.

Examiner agrees. Applicant further contends that a parameter (in this case surface roughness) must be first recognized as a result effective variable.

In reply, examiner respectfully presents that the surface roughness is determined by the particle size forming the surface, thus it is a resultant variable of disclosed particle size.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Karabi Guharay  
Primary Examiner  
Art Unit 2879

3/8/07